



Using LCA as a screening tool for bioenergy options – case study of a meat processing plant

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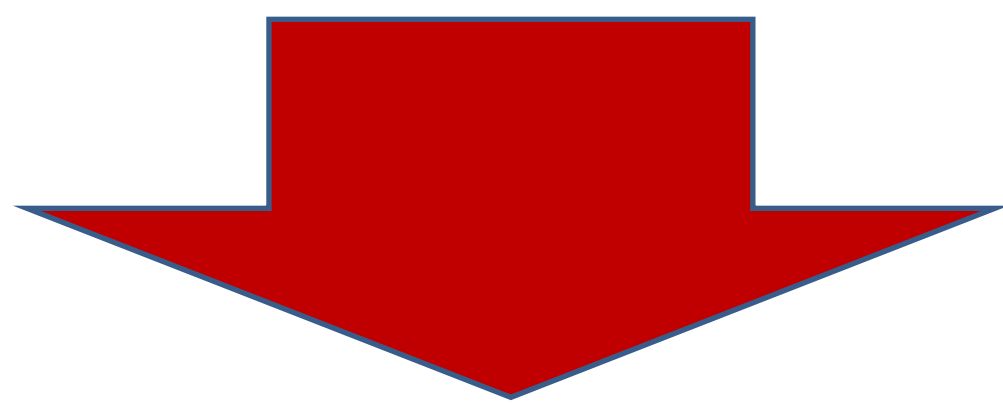
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1. Current site details

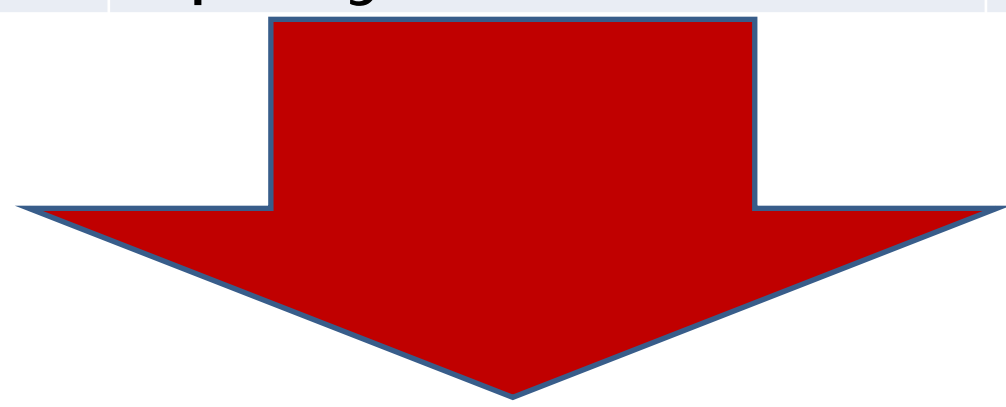
- Domestic kill & chill plant, no freezing, packaged HVAC units
- Regional location, not in a water constrained region
- Electricity from grid, no backup
- Thermal energy from coal, LPG, diesel
- Own transport fleet
- Onsite wastewater treatment pond system



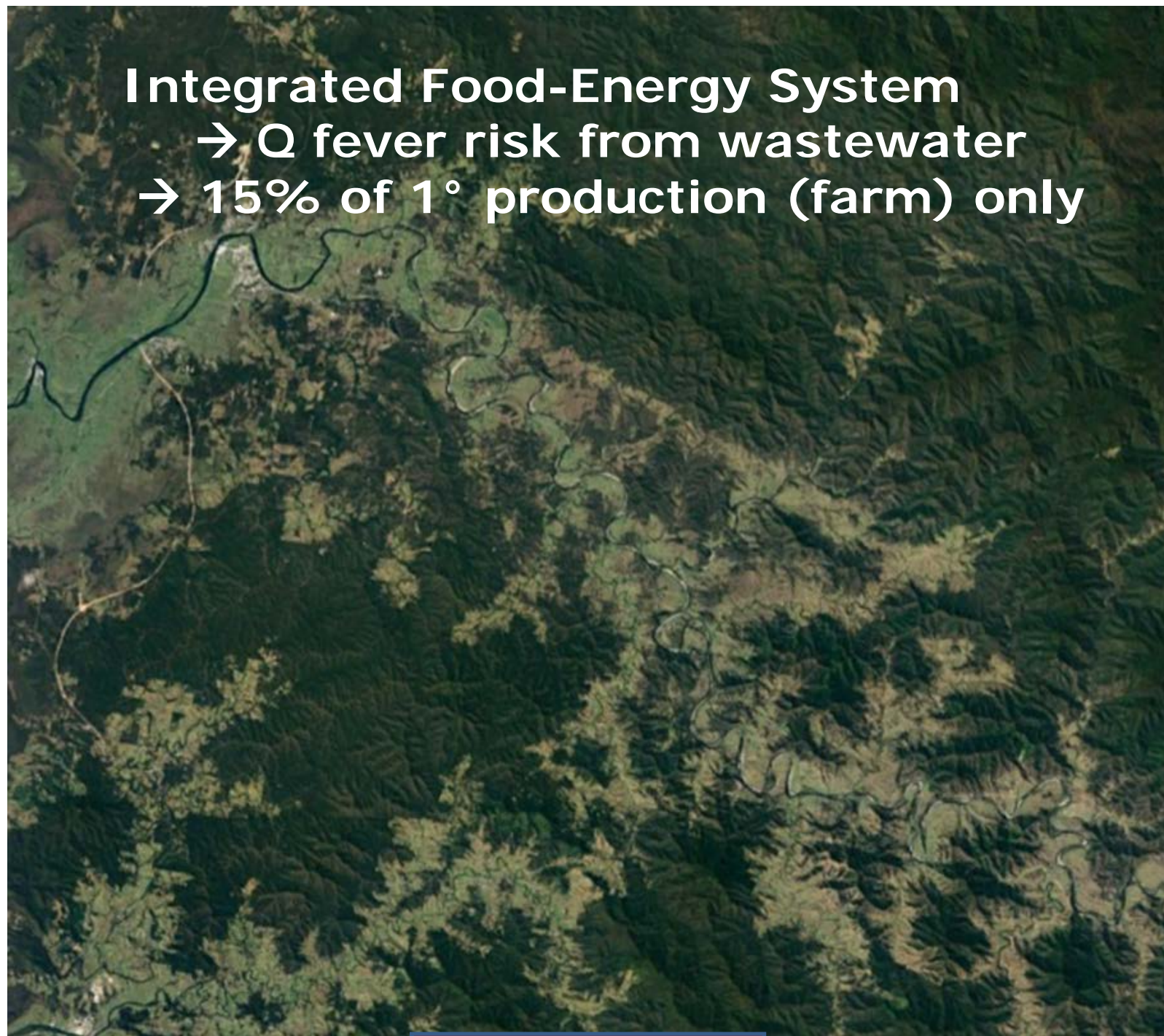
- Redundancy in electricity supply a priority
- Limit to use of recycled, treated effluent due to Q fever Risk

3. BIOMASS – LAND REQUIRED

Area of land required	For biomass production	For livestock production
per t HSCW (hectares)	0.03	20 (non-arable land)
Basis	<ul style="list-style-type: none">10.4 GJ per tonne15 t per hectare per year	Derived from Wiedemann, S., McGahan et al, 2015



1.Linear easements
= road + rail + Powerlines
= 8% of catchment



Integrated Food-Energy System
→ Q fever risk from wastewater
→ 15% of 1° production (farm) only

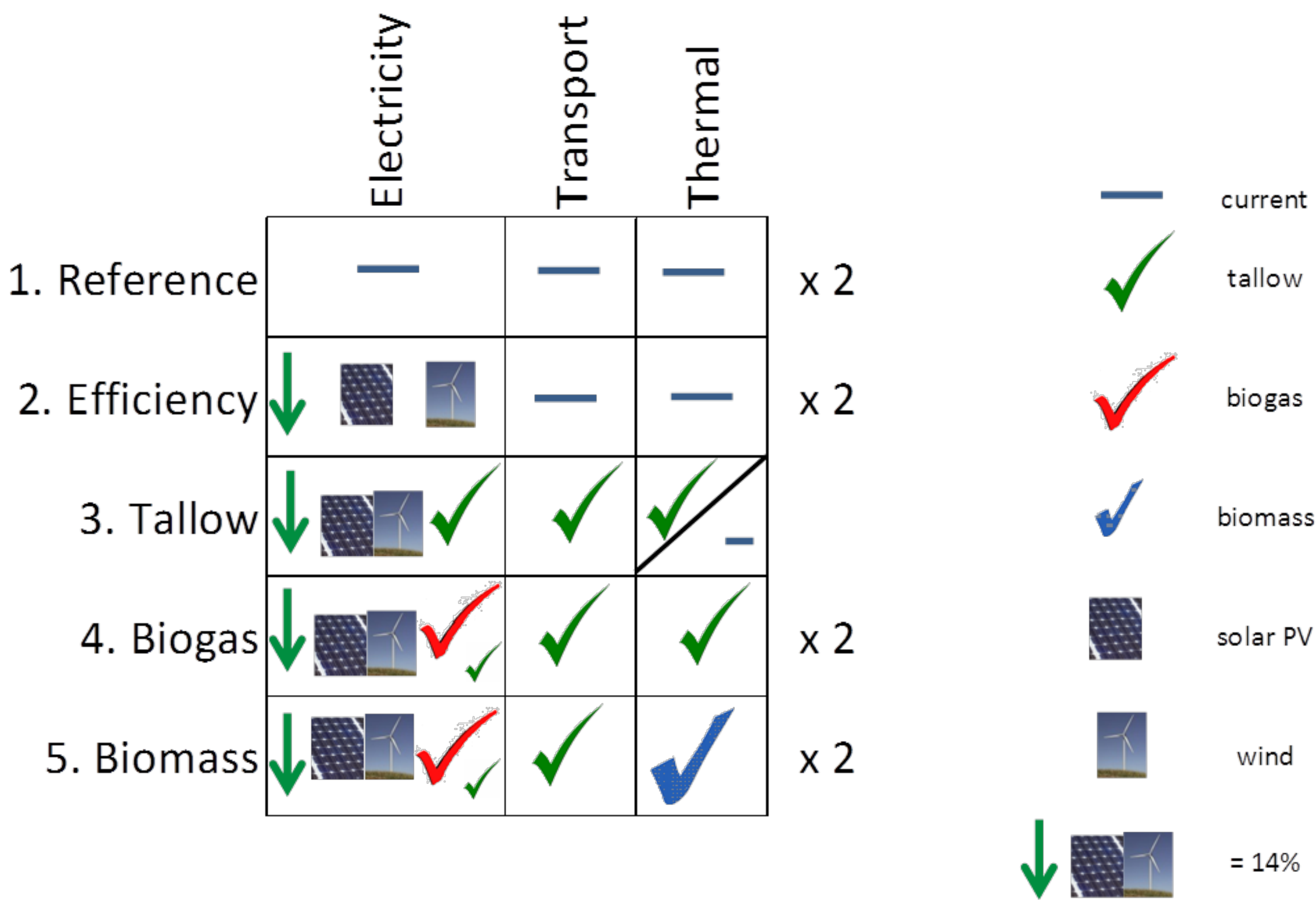
- ### 2. Land use zones
- Rural
 - 1° production
 - Landscape
 - Forestry
 - Small Lots
 - Residential
 - Commercial
 - Industrial
 - Infrastructure
 - Tourist
 - Recreation (private/public)
 - Park/reserve
 - Waterways
 - Environmental Conservation
 - Environmental Management
 - Environmental Living

Area required to produce biomass per t HSCW per year is equivalent to...

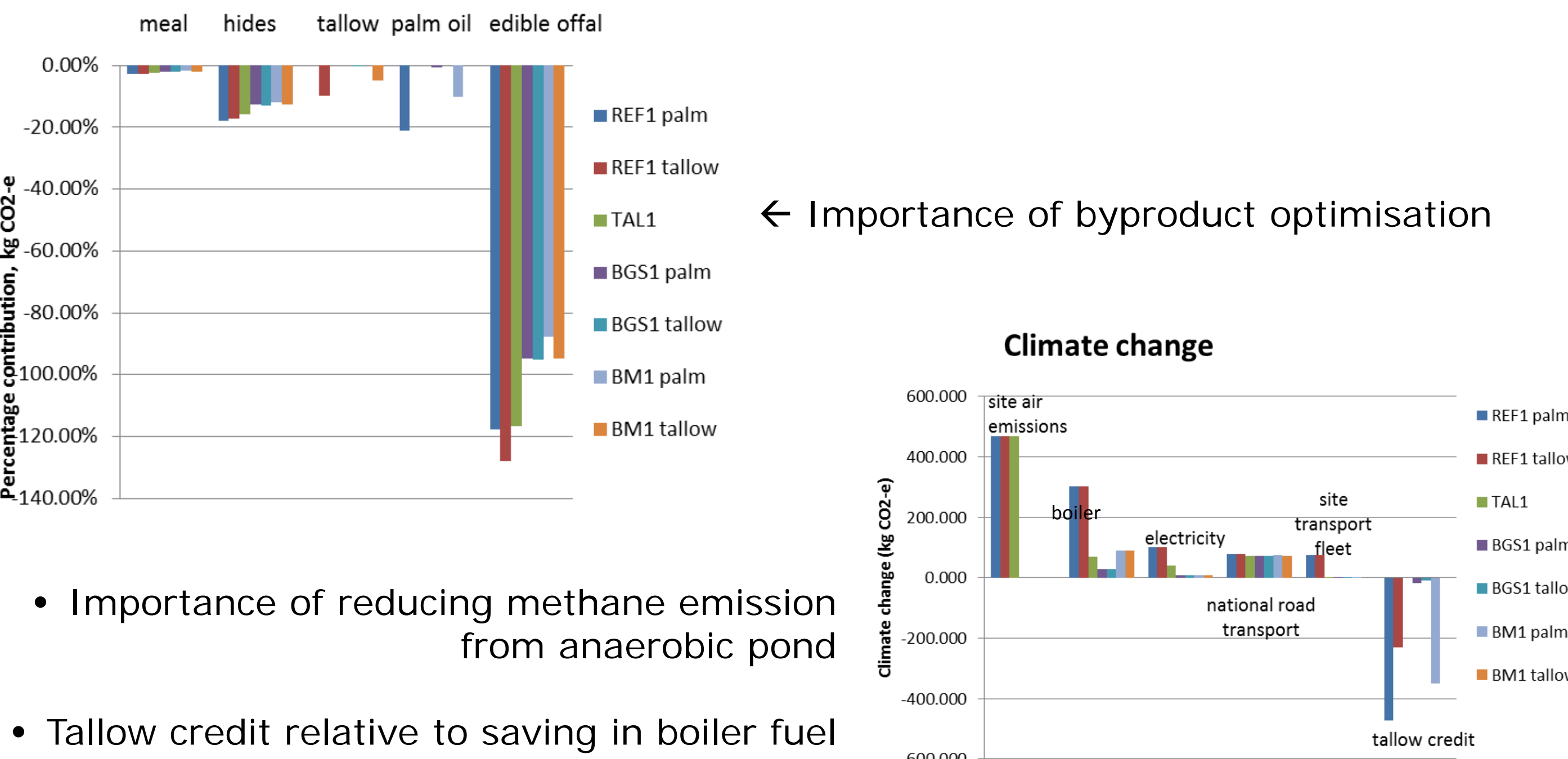
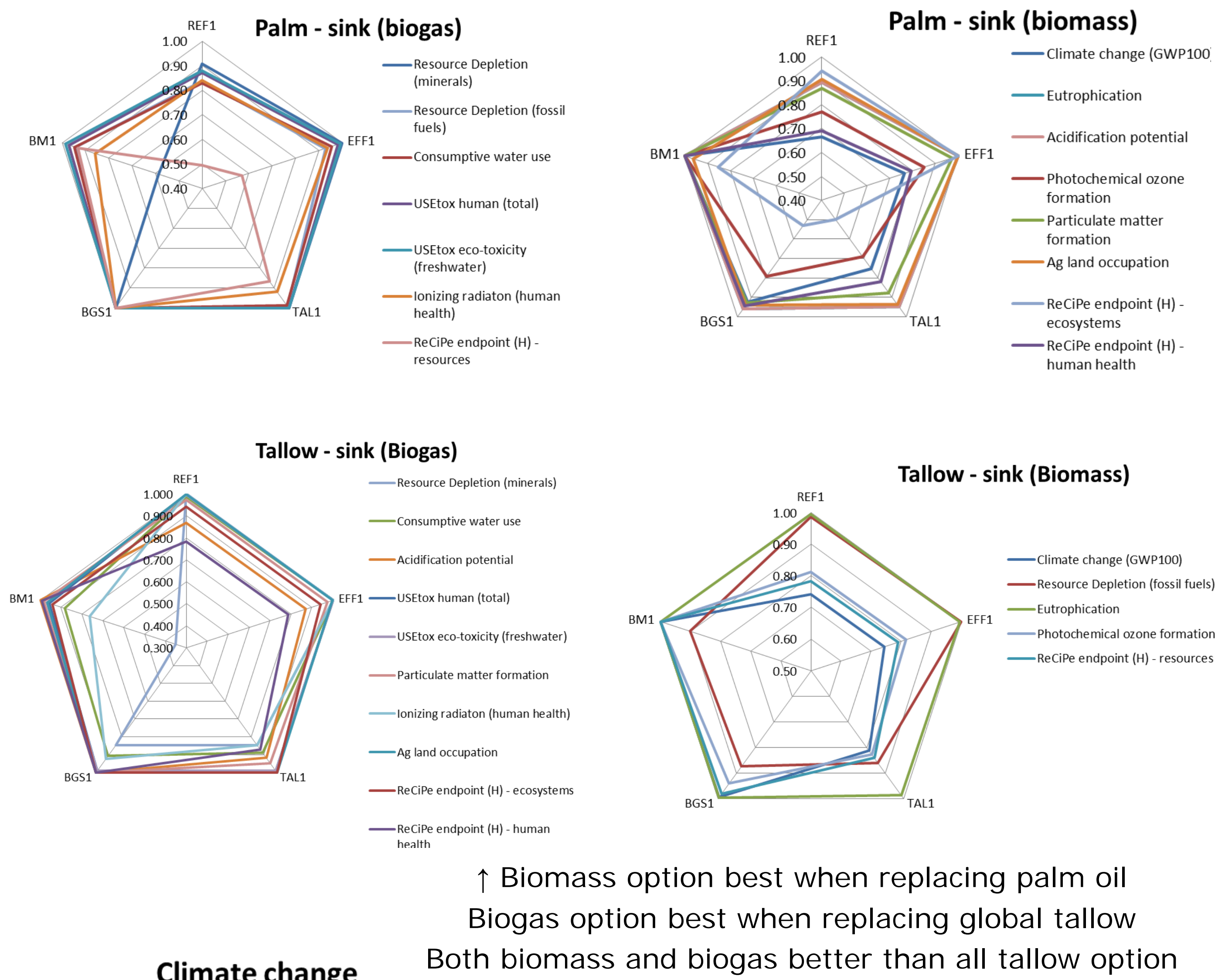
0.16% of total area required to produce livestock feed for plant	1.05% of total area required to produce livestock if 15% is used for growing biomass	10.5% of total area required to produce livestock if 1 in 10 farms participates and allocates 15% of land is used for growing biomass	0.01% of a square kilometre or 0.000001% of a 100km radius from the plant
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2. GATE-TO-GATE LCA

MODELLING SCENARIOS



MODELLING RESULTS



REFERENCES

Wiedemann, S., McGahan, E., Murphy, C., Yan, M.-J., Henry, B., Thoma, G., & Ledgard, S. (2015). Environmental impacts and resource use of Australian beef and lamb exported to the USA determined using life cycle assessment. Journal of Cleaner Production, 94, 67–75.

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